

## Claims

1. A method for compressing data representing a 3D unit vector comprising the steps of:
  - a) determining X, Y, and Z components from the vector;
  - b) determining in which octant of an octant pair the vector falls to derive octant pair data;
  - b) scaling the vector with a scaling factor;
  - d) deriving compressed data values to represent the vector from the octant pair data and the scaled vector data.
2. A method for compressing data representing a 3D unit vector according to claim 1 in which step b) uses the signs of the X, Y, and Z components to determine the octant pair data.
3. A method for compressing data representing a 3D unit vector according to claims 1 or 2 in which the scaling step is applied to the X and Y components.
4. A method for compressing data representing a 3D unit vector according to claim 3 in which the compressed data values are derived from the octant pair data and the scaled X and Y components in combination with the sign of the Z component.
5. Apparatus for compressing data representing a 3D unit vector comprising:
  - a) means for determining X, Y and Z components from the vector;
  - b) means for deriving octant pair data by determining in which octant of a plurality of octant pairs the vector falls;
  - c) means for scaling the vector data values;
  - d) means for deriving compressed data values to represent the vector from the octant pair data and the scaled vector data.

6. Apparatus for compressing data representing a 3D unit vector according to claim 5 in which the signs of the X, Y, and Z components are used to determine octant pair data.
7. Apparatus for compressing data representing a 3D unit vector according to claims 5 or 6 in which the scaling means applies the scaling factor to the X and Y components.
8. Apparatus for compressing data representing a 3D unit vector according to claim 5 in which the compressed data values are derived from the octant pair data and the scaled X and Y components in combination with the sign of the Z component.
9. A method for decompressing data representing a 3D unit vector from compressed data comprising three fields, the methods comprising the steps of:
  - a) identifying one of four octant pairs from data stored in the first field;
  - b) extracting first and second data values from second and third fields;
  - c) determining in which octant of the octant pair the vector falls;
  - d) deriving X, Y and Z components in dependence of the choice of octants;
  - e) normalising the X, Y, and Z components to derive a unit vector.
10. Apparatus for decompressing data representing a 3D unit vector from compressed data of three fields, the apparatus comprising:
  - a) means for identifying one of four octant pairs from data stored in the first field;
  - b) means for extracting first and second data values from the second and third fields respectively;

- c) means for determining in which octant of the identified octant pair the vector falls;
- d) means for deriving X, Y and Z components in dependence on the choice of octant;
- e) means for normalising the X, Y and Z components to derive a unit vector.